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COMMERCIAL FERTILIZERS.

By GEORGE ROBERTS.

BULLETIN No. 171.

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COMMERCIAL FERTILIZERS.

BY GEORGE ROBERTS.

Bulletin No. 162, issued in December, 1904, gives the results of fertilizer inspection work to December 1st of the fiscal year 1904-05. This report gives the results of the work to the end of the year, June 30th. A list of registered dealers and manufacturers, together with a list of their registered brands and materials, is given in Bulletin No. 162 and will not be repeated here. One additional dealer, Thomas Lewis of Sacramento, was admitted to registration in January of this year, but he immediately withdrew from such business as would be subject to the fertilizer law.

The samples herein reported are chiefly those taken by the inspector on his second trip for the year, made between January 1st and April 15th, and covering all sections of the State in which fertilizers are sold. On this inspection every lot of goods found was sampled up to six samples of a brand. The number of samples obtained should give a good idea of the general character of the goods put out by the various manufacturers.

On this inspection 132 samples of registered materials were taken, all of which have been analyzed and are herein reported, except one sample that was taken from a lot of goods that had been previously sampled, and three samples that were set aside because they were not taken in sufficient quantity, due to the inability of the inspector to obtain containers of sufficient size in the town where the goods were sampled.

Since the last report was issued 23 samples of registered materials have been received from farmers for analysis.

The following classification may be made of all samples analyzed for the fiscal year ending June 30, 1905:

	First Report.	Second Report.	Total.
Complete Fertilizers	50	107	157
Bone Meal and Tankage.....	12	27	39
Nitrogenous Superphosphates	4	3	7
Superphosphate and Potash	--	1	1
Nitrate of Soda.....	2	1	3
Sulfate of Potash.....	2	1	3
Bird and Bat Guano	2	5	7
Thomas Phosphate Powder	3	2	5
Blood	3	4	7
Total registered brands and materials	78	151	229
Pigeon Manure	--	1	1
Gypsum.....	2	6	8
	80	158	238

As has been the experience on all previous inspections, only a small proportion of the registered brands and materials were found on the market.

DEFICIENCIES.

In the 151 analyses of registered samples reported, the following number of deficiencies greater than allowed by law occur:

Available Phosphoric Acid (total when available is not guaranteed).....	22
Total Nitrogen	22
Potash	16
In valuation	11

ANALYSES FOR CONSUMERS.

Any user of fertilizers may, by paying the fee of two dollars specified by Section 4 of the fertilizer law, have a sample of his material analyzed. This fee is not to be regarded as paying the cost of the analysis. It is a nominal charge made to prevent the sending of samples through curiosity, as is always the case when analyses are made free of charge.

The sample should be drawn from not less than ten packages, if the lot is five tons or less; if the lot is over five tons, the sample should be drawn from not less than twenty packages. The larger the number of packages sampled, the more representative the sample will be. The sample drawn as specified above should be thoroughly mixed, great care being exercised to prevent the separation of coarse and fine materials. Not less than one quart should be taken from this sample to be sent to the Station for analysis. Whenever possible the sampling should be done in the presence of the agent, who should sign, as a witness, the certificate given below. If the sample is not drawn in the presence of the agent, it should be drawn in the presence of some other person, who should sign the certificate as a witness.

Samples for consumers will be given preference in the laboratory and the results will be reported as soon as possible. The sample should be sent, if possible, in time to receive the report before the fertilizer is used, in order that recourse may be had to the original packages in case of controversy with the manufacturer.

The form of certificate given below should be used in sending samples for analysis. Blank forms will be furnished upon application. All samples should be marked in some way so that they may be identified. Samples should be sent prepaid, addressed to the Fertilizer Control, Experiment Station, Berkeley, and should bear the name and address of the sender. Bank checks and money orders should be made payable to "The Regents of the University of California." Letters, certificates, and remittances should not be enclosed with the samples, but mailed separately. When the report of analysis is received, a tag or label taken from one of the bags sampled should at once

be sent to the Station, and the name and address of the agent from whom the goods were purchased should be given. Analyses will be made only for those who purchase fertilizers for their own use. Any one refusing to send a tag or label as specified above will be excluded from further privileges under the above provisions.

CERTIFICATE FOR CONSUMER'S ANALYSIS.

Director Agricultural Experiment Station, University of California, Berkeley, Calif.

This is to certify that I am not a dealer in, or agent for the sale of any fertilizer, and that the fertilizer, a sample of which I have sent you for analysis, was purchased by me _____, 190 , for my own use and not for sale.

I further certify that the amount purchased was _____ tons and that the sample was drawn from _____ packages and was thoroughly mixed.

Upon receipt of the analysis from you, I agree to furnish you with a tag or label taken from one of the packages sampled, and the name and address of the firm or agent of whom the fertilizer was purchased. I enclose two dollars analysis fee.

(Signature)_____

(P. O. Address)_____

(Date) _____

(Signature of Witness)

VALUATION OF FERTILIZERS.

The "agricultural value" and the "commercial value" of fertilizing materials are not synonymous terms. The agricultural value of a fertilizer is determined by the increase and quality produced by it in the crop. The commercial value of a fertilizer is determined by the cost of the materials which enter into its composition. A fertilizing material of high commercial value may have a low agricultural value on a particular soil or crop. On another soil or crop the same material may have a high agricultural value.

In calculating the values given in this report the Experiment Station does not undertake to say what the retail prices of fertilizers should be in this State. The values given are for the unmixed raw materials which enter into the fertilizer, and do not take into account the cost of grinding, mixing, bagging, insurance, drayage, agent's commission, and other expenses of the manufacturer.

The schedule of values used is given below. They represent, as nearly as can be determined, the prices at which fertilizing ingredients in raw materials of good quality can be bought at retail for cash at the warehouse in our largest markets, like San Francisco. Quotations were called for from dealers, but they varied so widely that it was very difficult to arrive at a schedule of values that represent the actual market conditions.

The estimation of values is not without its use, even if the schedule used does not represent the actual market conditions. In the first place, a comparison of values calculated upon the guarantee and the

analysis shows whether the goods have the commercial value represented by the guaranteed analysis. In the second place, the calculation of values upon different guaranteed analyses enables the purchaser to determine which dealer offers him plant food at the lowest price, provided, of course, that the materials offered are of the same quality.

In reading the report of analyses, the column of values is the last one to be considered. The first things to consider are the materials used and the analysis as compared with the guarantee. From the very nature of the case the analysis must differ somewhat from the guarantee, but the variation should not be so great as to change the nature of the fertilizer. Such a variation might take place, and at the same time the value calculated upon the guarantee be greater than the value calculated upon the analysis. Suppose, for example, that a fertilizer should be guaranteed to have the composition indicated by the first column below, and upon analysis it should show the composition indicated by the second column.

	Guaranteed.	Found.
Available Phosphoric Acid.....	8 per cent.	10 per cent.
Insoluble Phosphoric Acid	2 “	2 “
Total Phosphoric Acid	10 “	12 “
Nitrogen	3 “	3 “
Potash	5 “	3 “

According to the schedule of values now in use these two compositions would have the same commercial value, yet they are essentially different. Such variations as the above are sometimes met with.

SCHEDULE OF TRADE VALUES.

<i>Phosphoric Acid.</i>		Cents per Pound.
Available (water- and citrate-soluble).....		6
Insoluble in mixed fertilizers		2½
Insoluble in plain acid phosphate		0
In fine* bone and tankage		4½
In medium* bone and tankage.....		3½
In fine* Thomas phosphate powder.....		5¼†
In medium* Thomas phosphate powder		3¼†
<i>Nitrogen.</i>		
In ammonia salts		18
In nitrates		15½
Organic in—		
Blood.....		18
Fish, meat, and mixed fertilizers.....		17½
Fine* bone and tankage		17
Medium* bone and tankage		14
<i>Potash.</i>		
From sulfate		6
From muriate.....		5

*Fine and medium bone are separated by a sieve with 50 meshes to the inch; fine and medium tankage by a 25-mesh sieve; and fine and medium Thomas phosphate powder by a 100-mesh sieve.

†This method of giving a valuation to Thomas phosphate powder is temporary, awaiting the adoption of methods by the Association of Official Agricultural Chemists.

To illustrate the method of calculating the value of a fertilizer, the following example is given:

	Guaranteed Analysis.	Value per lb.	
Available Phosphoric Acid.....	8.00 % @	6 cents = \$0.48	per 100 lbs.
Insoluble Phosphoric Acid.....	2.00 % @	2½ cents = 0.05	“ “ “
Total Phosphoric Acid	10.00		
Nitrogen in Nitrates	1.50 % @	15½ cents = 0.23¼	“ “ “
Nitrogen in Organic Matter	2.50 % @	17½ cents = 0.43¾	“ “ “
Total Nitrogen	4.00		
Potash from Sulfate	4.00 % @	6 cents = 0.24	“ “ “
Value.....		\$1.44	“ “ “

$$\$1.44 \times 20 = \$28.80 \text{ per ton.}$$

MECHANICAL CONDITION OF FERTILIZERS.

The mechanical condition of fertilizers is an extremely important consideration. Especially is this true of those materials in the fertilizer which are not soluble in water. It may be laid down as a general principle that the availability of a given insoluble fertilizing material varies directly with its fineness. It is almost needless to say, for example, that bone meal and tankage are much more effective when finely ground. For this reason, in these reports the fineness of these materials is given. Fineness is really a better test of their availability than the chemical tests of solution in various solvents. Fineness and evenness of distribution have more to do with the efficiency of a fertilizer than is generally supposed. The very object sought in using water-soluble phosphoric acid and potash is fineness of division and evenness of distribution by solution, for both of these materials soon become insoluble by fixation in the soil, *but in an extremely finely divided and well-distributed condition*, provided they were put in solution by sufficient rain or irrigation.

Fertilizers in poor mechanical condition will not remain well mixed. For example, if sulfate of potash, which is a heavy and finely ground material, is mixed with coarse dry material, the inevitable result is *unmixing* on handling. The same is true for any mixture of fine and coarse materials. Figures 1, 2, and 3 (one third natural size) forcibly illustrate this point. The sample from which the photographs for these cuts were made was sent to the Station for analysis. Its identity is known only to the writer, hence this publication can not be given a personal significance. The sample was shipped in a quart fruit-jar which lay in a horizontal position in the box in which it was shipped and the sample was photographed in the exact condition in which it was received. Fig. 1 shows the side which was up in shipping, Fig. 2 the bottom side, while Fig. 3 shows the jar in such a position as to show both



FIG. 1.

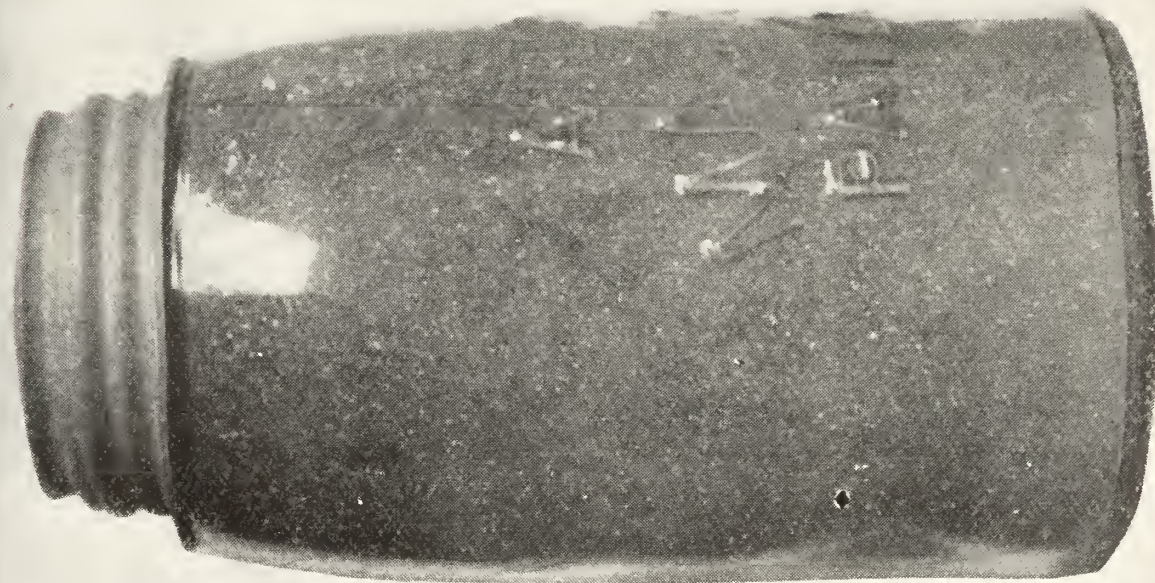


FIG. 2.
One-third natural size.



FIG. 3.

top and bottom. Notice how the fine materials sift to the bottom. If this is true for a jar of material which was but a day on the road, it must also be true for such materials when subject to the rough handling of freight shipment. Many variations from guarantee are no doubt to be accounted for in this way.

An examination of mechanical condition is one that the farmer can make for himself, and he can do it more effectively than it can be done for him; for when the manufacturer knows that his sales will depend largely upon mechanical condition, he will take no chances. There is no provision in the law by which a manufacturer may be held responsible for the mechanical condition of his goods. The presumption is that the farmer will look to that matter himself.

The chief reason for the existence of fertilizer factories is the production of well-mixed goods of good mechanical condition, at a cost lower than that for which the farmer can mix them. If this is not the chief reason, then the farmer had better buy his own materials and mix them in such proportions as his own experience shows him are best suited to his needs.

IMPORTANT.

Caution to Purchasers of Fertilizers.

Farmers are requested not to purchase fertilizers that are not labeled to meet the requirements of the law, and not to attempt to purchase them from any one but registered dealers or their authorized agents. Any farmer who purchases fertilizers under any other conditions does not deserve the protection of the law, and the manufacturer or dealer who does not label his goods according to the full requirements of the law is liable to prosecution and should in nowise be patronized by farmers. It is quite liable to happen, and does happen, that now and then a manufacturer may miss his guarantee without intending to do so, but it is impossible that he would have his labels printed in non-conformity to the law without doing so either intentionally or through gross carelessness. Farmers can render great assistance in enforcing the law by observing the above caution.

During the first two years of the operation of the fertilizer law, some irregularities in the matter of labeling have been met with, but in all cases the manufacturers and dealers concerned have protested that they were unintentional and were the result of a misunderstanding of the requirements of the law. In most instances such has appeared to be the case; but there is no longer any reason to believe that all concerned do not fully understand the requirements of the law.

Every bag or package of fertilizer and fertilizing material, whether a regular brand or a special mixture, should carry a label or tag bearing the following:

1. Name and address of manufacturer and place of manufacture.
2. Registration number.
3. Name or brand of fertilizer.
4. Guaranteed analysis, giving percentage of
 - Available phosphoric acid ;
 - Insoluble phosphoric acid ;
 - Total phosphoric acid.
 - Nitrogen in nitrates ;
 - Nitrogen in ammonia salts ;
 - Organic nitrogen ;
 - Total nitrogen.
 - Potash.Or such of these ingredients as may be present.
5. A statement of the materials from which the above ingredients are derived.

In case of bone meal, tankage, and Thomas phosphate powder, a guarantee of available phosphoric acid is not required when these materials are not acidulated.

No dealer or manufacturer, except those who have certificates of registration from the University of California, and their authorized agents, can legally sell fertilizers in this State. No person or company has any right to use any registration number except in connection with the firm name to which the registration certificate of such number has been issued; and no person or company to whom a registration number has been assigned has any right to give any other person or company permission to use said registration number, and any number so used is a fraud. No agent has any right to use his principal's registration number in connection with his own name.

REPORT OF ANALYSES.

The following tables give the results of all analyses made since the publication of Bulletin No. 162.

Available phosphoric acid is not determined in bone meal, tankage, and Thomas phosphate powder, unless requested. The fineness of these materials is determined, fine and medium bone being separated by a sieve of 50 meshes to the inch; tankage by a 25-mesh sieve; and Thomas phosphate powder by a 100-mesh sieve.

Some fertilizers containing all three ingredients are rated as tankage, because they are non-acidulated tankage products with potash salts added, and do not carry a guarantee of available phosphoric acid.

Nitrogen in ammonia salts will, in some cases, be found reported when nitrogen in this form is not guaranteed. In some of such cases this form of nitrogen is produced by conversion of organic nitrogen during process of manufacture, and is not to be considered a deviation from

guarantee of materials used. This form is not reported separately when less than 0.20 per cent, unless it has been guaranteed, but is included in the total. Guanos carry more or less nitrogen in nitrates and ammonia salts, and when any appreciable quantity of guano is used the manufacturer should take into account the fact that some nitrogen will show as nitrates and ammonia salts. The failure to take this into consideration may perhaps account for the appearance of these forms of nitrogen in some samples in which only organic nitrogen was guaranteed.

The percentage of chlorin is given when it exceeds 0.50 per cent. It is a matter of only technical interest whether chlorin present is from muriate of potash, kainit, or from common salt that may be in some of the materials used. If a manufacturer uses sulfate of potash and uses a tankage with it containing a large amount of chlorin, from a practical standpoint he has lowered the grade of his fertilizer just as much as if he had used muriate of potash instead of sulfate of potash. Chlorin from all other sources is as objectionable as from muriate of potash. However, if muriate of potash is found when sulfate is guaranteed, the fact will be published.

The following abbreviations are used in the tables: Bl=blood; Bn=bone; Fs=fish; G=guano; Super=superphosphate; T=tankage.

Guarantees are entered in *italics*. Deficiencies greater than allowed by law are entered in bold type.

ANALYSES AND VALUATIONS.

Laboratory Number.....	NAME AND ADDRESS OF MANUFACTURER OR DEALER AND NAME OF BRAND.	FROM WHOM OBTAINED.	Value per Ton at Station Prices.....
	Agricultural Chemical Works, Los Angeles, Cal.		
274	Bat Guano ----- Guaranteed -----	Thomas Moffatt, Rialto -----	\$23.79 23.31
275	Berry ----- Guaranteed -----	Manufacturers -----	22.34 24.15
276*	Blood and Bone Fertilizer -----	M. B. Campbell, Claremont -----	28.49
277*	do ----- Guaranteed -----	E. A. Moore, Redlands -----	27.45 25.76
278*	Blood and Bone Fertilizer -----	Manufacturers -----	29.02
279*	do -----	Fletcher, Doyle & Co., San Diego -----	27.59
336*	do ----- Guaranteed -----	Elizabeth Marshall, Redlands -----	27.63 25.26
250	Grape Fertilizer ----- Guaranteed -----	Beckman & Beattie, Lodi -----	23.90 23.95
251	No. 1 Orange and Lemon Fertilizer -----	R. W. Dawson, Glendora -----	28.47
283	do -----	Robert Gray, Ontario -----	26.84
284	do ----- Guaranteed -----	Fletcher, Doyle & Co., San Diego -----	26.44 28.10
286	Special Orange and Lemon for Heavy Soil -----	Manufacturers -----	23.76
287	do -----	G. D. Avery, Porterville -----	22.38
288	do -----	W. H. Collins, Covina -----	24.94
289	do ----- Guaranteed -----	G. A. Herdeg, Riverside -----	23.92 22.90
252	Special Orange and Lemon for Light Soil -----	R. W. Dawson, Glendora -----	23.44
290	do -----	Thomas Moffatt, Rialto -----	22.25
291	do -----	Manufacturers -----	22.40
292	do -----	W. H. Collins, Covina -----	22.65
293	do ----- Guaranteed -----	Thomas Moffatt, Rialto -----	22.19 23.10
294	Special Orange and Lemon for Non-Fruiting Trees ----- Guaranteed -----	A. Thorman, Claremont -----	23.41 23.40
295	Special Orange and Lemon for Non-Fruiting Trees ----- Guaranteed -----	Fletcher, Doyle & Co., San Diego -----	23.36 23.60
296	Riverside Special Orange and Lemon Fertilizer -----	E. A. Moore, Redlands -----	26.96
297	do -----	G. D. Avery, Porterville -----	26.04
298	do -----	Manufacturers -----	25.32
299	do -----	G. A. Herdeg, Riverside -----	26.38
300	do ----- Guaranteed -----	Fletcher, Doyle & Co., San Diego -----	24.75 25.70

* The following samples are rated as tankage :
276—79 per cent fine. 278—79 per cent fine. 336—75 per cent fine.
277—81 per cent fine. 279—77 per cent fine.

ANALYSES AND VALUATIONS.

Laboratory Number.....	POUNDS PER HUNDRED.												
	PHOSPHORIC ACID.				NITROGEN.					POTASH.			Chlorin
	Available ..	Insoluble ..	Total	Guaranteed as Derived From	In Nitrates.	In Ammonia Salts..	Organic	Organic Nitrogen Guaranteed as Derived From	Total	From Muriate..	From Sulfate....	Total	
274	5.69 6.60	1.28 1.76	6.97 8.36	----- B, G	2.08	0.69	2.13	Forms of Nitrogen not given on labels.	4.90 4.13	----- -----	----- -----	0.48 0.60	----- -----
275	4.57 6.00	3.09 2.00	7.66 8.00	----- T, Super	-----	-----	2.70 2.50	Bl, Bn, T	2.70 2.50	----- -----	4.88 6.00	----- -----	----- -----
276	8.69	6.53	15.22	-----	-----	-----	4.51	-----	4.51	-----	-----	-----	0.80
277	8.90 5.00	7.69 10.00	16.59 15.00	----- Bn, T	-----	-----	3.94 4.50	Bl, Bn	3.94 4.50	----- -----	----- -----	----- -----	0.56 -----
278	8.46	6.66	15.12	-----	-----	-----	4.74	-----	4.74	-----	-----	-----	0.54
279	7.35	4.87	12.22	-----	-----	-----	4.98	-----	4.98	-----	-----	-----	4.56
336	5.88 5.00	7.91 9.00	13.79 14.00	----- Bn, T	-----	-----	5.11 4.50	Bl, Bn, T	5.11 4.50	----- -----	----- -----	----- -----	----- -----
250	5.47 6.00	2.58 2.00	8.05 8.00	----- Bn, T, Super	0.76	-----	1.89	Bl, Bn, T	2.65 2.50	----- -----	5.89 6.00	----- -----	0.62 -----
251	5.60	4.72	10.32	-----	0.42	-----	3.62	-----	4.04	-----	-----	4.52	2.64
283	5.13	6.32	11.45	-----	1.00	-----	2.75	-----	3.75	-----	-----	4.01	2.38
284	4.61 5.00	4.35 5.00	8.96 10.00	----- Bn, T, Super	0.96 1.00	-----	2.84 3.00	Bl, Bn, T	3.80 4.00	----- -----	4.84 5.00	----- -----	0.82 -----
286	5.52	4.53	10.05	-----	1.08	-----	2.06	-----	3.14	-----	3.59	-----	0.58
287	5.12	4.31	9.43	-----	0.95	-----	2.06	-----	3.01	-----	3.26	-----	-----
288	4.48	5.69	10.17	-----	1.38	-----	2.18	-----	3.56	-----	4.00	-----	-----
289	5.34 6.00	5.26 4.00	10.60 10.00	----- Bn, T, Super	0.76 1.00	-----	2.44 2.00	Bl, Bn, T	3.20 3.00	----- -----	3.32 3.00	----- -----	0.74 -----
252	5.60	2.13	7.73	-----	0.44	-----	2.71	-----	3.15	-----	-----	4.00	1.58
290	5.24	2.48	7.72	-----	Trace	-----	2.91	-----	2.91	-----	3.78	-----	-----
291	5.82	2.28	8.10	-----	0.82	-----	1.95	-----	2.77	-----	4.09	-----	-----
292	5.57	2.28	7.85	-----	Trace	-----	2.91	-----	2.91	-----	3.86	-----	0.58
293	5.22 6.00	2.58 2.00	7.80 8.00	----- Bn, T, Super	Trace 1.00	-----	2.76 2.00	Bl, Bn, T	2.76 3.00	----- -----	4.15 4.00	----- -----	0.56 -----
294	6.84 7.50	5.13 4.50	11.97 12.00	----- Bn, T, Super	Trace 0.50	-----	2.69 2.00	Bl, Bn, T	2.69 2.50	----- -----	2.68 3.00	----- -----	0.64 -----
295	7.58 7.50	3.39 4.50	10.97 12.00	----- Bn, T, Super	-----	-----	2.43 2.50	Bl, Bn, T	2.43 2.50	----- -----	3.38 3.00	----- -----	----- -----
296	6.60	2.25	8.85	-----	0.73	-----	3.39	-----	4.12	-----	-----	3.15	1.94
297	5.03	4.39	9.42	-----	0.93	-----	3.24	-----	4.17	-----	2.99	-----	0.78
298	5.05	4.75	9.80	-----	0.97	-----	2.91	-----	3.88	-----	3.07	-----	0.80
299	5.41	4.12	9.53	-----	0.81	-----	3.31	-----	4.12	-----	3.11	-----	-----
300	5.39 5.00	3.20 5.00	8.59 10.00	----- Bn, T, Super	0.62 1.00	-----	3.15 3.00	Bl, Bn, T	3.77 4.00	----- -----	3.11 3.00	----- -----	0.66 -----

ANALYSES AND VALUATIONS—Continued.

Laboratory Number	NAME AND ADDRESS OF MANUFACTURER OR DEALER AND NAME OF BRAND.	FROM WHOM OBTAINED.	Value per Ton at Station Prices
	Agricultural Chemical Works, Los Angeles, Cal.		
285	Special Orange and Lemon Fertilizer Guaranteed	G. A. Herdeg, Riverside	\$24.07 24.60
409	Special Orange and Lemon Fertilizer. Guaranteed	Valentine Peyton, Highland	33.42 28.44
	American Agricultural Chemical Co., Los Angeles, Cal.		
310	Bradley's Fruit and Vine Guaranteed	Graham-Cope Com'l Co., Redlands	28.19 24.16
253	Bradley's Special Fruit and Vine Guaranteed	W. R. Powell, Glendora	33.78 31.95
254	Bradley's Nursery Stock	Eben Boalt, Palermo	27.63
255	do	R. H. Hille, Fernando	28.88
311	do	A. P. Johnson, Pachappa	27.72
312	do	S. H. Barrett, East Highland	27.25
313	do	R. S. Thompson, Highland	27.82
314	do Guaranteed	Graham-Cope Com'l Co., Redlands	27.06 26.48
256	Bradley's Orange and Lemon	Eben Boalt, Palermo	27.29
257	do	N. W. Blanchard, Santa Paula	27.83
258	do Guaranteed	R. H. Hille, Fernando	27.48 25.56
	Armour Fertilizer Works, Los Angeles, Cal.		
315	Armour's Dried Blood Guaranteed	J. S. Edwards, East Highland	46.78 46.80
316*	Armour's Bone Meal	G. W. Russel, Ontario	29.62
317*	do Guaranteed	Blake Bros., Pasadena	29.35 27.83
318	Armour's Acidulated Bone Meal Guaranteed	J. C. Boyd, Rialto	27.48 24.75
319	Armour's Bone, Blood and Potash	G. W. Russel, Ontario	32.18
320	do Guaranteed	J. C. Boyd, Rialto	33.24 32.40
321	Armour's Fruit Special	Griffin & Skelley, Fresno	22.29
322	do Guaranteed	J. C. Boyd, Rialto	21.45 21.85
323	Armour's Fruit and Vine Fertilizer	J. C. Boyd, Rialto	27.52
324	do	Redlands Fruit Association	29.59
325	do Guaranteed	J. S. Edwards, East Highland	27.17 27.20
326	Armour's Lawn and Garden Fertilizer Guaranteed	Blake Bros., Pasadena	18.78 23.50

* 316—64 per cent fine.
* 317—65 per cent fine.

ANALYSES AND VALUATIONS—Continued.

Laboratory Number	POUNDS PER HUNDRED.												Chlorin
	PHOSPHORIC ACID.				NITROGEN.					POTASH.			
	Available	Insoluble	Total	Guaranteed as Derived From	In Nitrates	In Ammonia Salts	Organic	Organic Nitrogen Guaranteed as Derived From	Total	From Muriate	From Sulfate	Total	
285	5.25 5.00	4.00 5.00	9.25 10.00	Bn, T, Super	0.72 1.00		2.26 2.00	Bl, Bn, T	2.98 3.00		4.69 5.00		0.58
409	8.66 5.00	3.42 5.00	12.08 10.00		1.22	0.64	2.64	No sources given on label.	4.50 4.10		5.00 5.00		1.96
310	8.37 7.00	1.33 1.00	9.70 8.00	All samples of this company bone and mineral phosphates.	2.46 2.25		0.80 0.65	All samples of this company Bl, Bn, Fs, G, T	3.43 2.90		5.37 5.00		
253	7.33 7.00	1.28 1.00	8.61 8.00		2.79	0.20	0.65		3.64 3.50		10.58 10.00		0.74
254	9.33	1.62	10.95		2.70	0.35	1.00		4.05		2.08		0.60
255	9.67	1.58	11.25		2.91	0.42	1.02		4.35		1.99		
311	9.65	1.17	10.82		3.20	0.24	0.70		4.14		1.93		
312	9.26	1.74	11.00		3.11	0.15	0.77		4.03		1.99		
313	9.92	1.72	11.64		2.74	0.17	1.00		3.91		2.05		
314	9.24 9.00	2.00 1.00	11.24 10.00		2.72 2.50	0.19 0.30	0.99 1.30		3.90 4.10		1.99 1.50		
256	8.71	1.54	10.25		2.95		0.78		3.73		3.49		
257	8.36	1.53	9.89		2.07	0.51	1.40		3.98		3.22		0.52
258	8.29 8.00	2.35 1.00	10.64 9.00		2.59 2.75		1.26 0.95		3.85 3.70		3.26 3.00		
315							12.99 13.00		12.99 13.00				
316			20.67				3.93		3.93				
317			20.45 24.00				3.90 2.50		3.90 2.50				
318	16.18 15.00	3.01 3.00	19.19 18.00				1.87 1.50		1.87 1.50				
319	8.43	0.69	9.12		1.48		2.47		3.95		7.06		0.64
320	8.06 8.00	1.53 2.00	9.59 10.00	Bn, Super	1.30 1.50		2.95 2.50	Bl, Bn, T	4.25 4.00		7.03 7.00		0.96
321	6.67	2.41	9.08		See foot note.		1.87		1.87		5.44		0.54
322	6.80 8.00	1.86 2.00	8.66 10.00	Bn, Super			1.63 1.50	Bl, Bn, T	1.63 1.50		5.54 5.00		
323	7.17	0.79	7.96		0.99		1.34	Contain bat	2.33		8.96		0.74
324	7.98	1.33	9.31		0.75		1.54	guano. None	*2.29		9.69		0.56
325	7.25 6.00	1.02 2.00	8.27 8.00	Bn, Super	0.57	0.25	1.18 2.00	guaranteed. Bl, Bn, T	2.00 2.00		9.30 10.00		0.56
326	4.27 4.00	0.76 1.00	5.03 5.00	Bn, G, Super	1.58 1.50		1.36 2.50	Bl, Bn, G	2.94 4.00		3.01 4.00		

321—Only total Nitrogen specified for this sample. Nit. Sod. guaranteed present. Trace found.
*324—Only total Nitrogen specified for this sample. Nit. Sod. guaranteed.

ANALYSES AND VALUATIONS—Continued.

Laboratory Number.....	NAME AND ADDRESS OF MANUFACTURER OR DEALER AND NAME OF BRAND.	FROM WHOM OBTAINED.	Value per Ton at Station Prices.....
	Armour Fertilizer Works, Los Angeles, Cal.		
327	Armour's Orange Tree Manure.....	W. T. Henderson, Riverside.....	\$24.85
328	do.....	Frank Palmer, North Pomona.....	29.67
329	do.....	G. W. Russel, Ontario.....	27.14
	Guaranteed.....		25.30
248	Armour's Special Fertilizer.....	James M. Riley, Azusa.....	34.80
	Guaranteed.....		33.10
330	Armour's Special Fertilizer.....	J. C. Boyd, Rialto.....	27.95
	Guaranteed.....		34.00
331	Armour's Special Fertilizer.....	R. T. Murrell, North Pomona.....	31.14
	Guaranteed.....		30.60
332	Armour's Special 582.....	J. S. Edwards, East Highland.....	26.60
333	do.....	Redlands Fruit Association.....	30.12
	Guaranteed.....		27.00
334*	Armour's Tankage.....	W. T. Henderson, Riverside.....	29.24
335*	do.....	J. S. Edwards, East Highland.....	31.82
	Guaranteed.....		26.74
	Balfour, Guthrie & Co., San Francisco, Cal.		
259	Nitrate of Soda.....	Beckman & Beattie, Lodi.....	48.55
	Guaranteed.....		46.50
260*	Thomas Phosphate Powder.....	Beckman & Beattie, Lodi.....	15.69
	Guaranteed.....		15.92
261*	Thomas Phosphate Powder.....	M. Braughler, Santa Rosa.....	17.43
	Guaranteed.....		17.57
	California Fertilizer Works, San Francisco, Cal.		
235	Fruit and Vine.....	F. Schmidt, Healdsburg.....	30.11
337	do.....	Fresno Home Packing Co., Fresno.....	27.96
	Guaranteed.....		25.83
263*	High-Grade Bone Meal.....	Sam Meyer, Healdsburg.....	25.07
	Guaranteed.....		24.19
264	Special Hop.....	Sam Meyer, Healdsburg.....	32.13
	Guaranteed.....		28.25
265	Orange Tree.....	William Calder, Folsom.....	27.39
	Guaranteed.....		24.83
266	Orange Tree (B).....	William Calder, Folsom.....	30.80
	Guaranteed.....		28.46

* 334—65 per cent fine.
* 335—67 per cent fine.
* 260—73 per cent fine.
* 261—78 per cent fine.
* 263—58 per cent fine.

ANALYSES AND VALUATIONS—Continued.

Laboratory Number.....	POUNDS PER HUNDRED.												Chlorin
	PHOSPHORIC ACID.				NITROGEN.					POTASH.			
	Available ..	Insoluble ..	Total.....	Guaranteed as Derived From	In Nitrates	In Ammo- nia Salts..	Organic	Organic Nitrogen Guaranteed as Derived From	Total.....	From Muriate.....	From Sulfate.....	Total.....	
327	8.70	0.46	9.16	-----	1.62	-----	1.42	-----	3.04	-----	3.49	-----	-----
328	9.29	3.11	12.40	-----	1.68	-----	2.09	-----	3.77	-----	3.69	-----	-----
329	8.47	1.02	9.49	-----	1.65	-----	1.64	-----	3.29	-----	4.67	-----	-----
	8.00	2.00	10.00	Bn, Super	1.50	-----	1.50	Bl, Bn, T	3.00	-----	4.00	-----	-----
248	6.38	4.36	10.74	-----	0.37	0.26	4.69	-----	5.32	-----	5.38	-----	0.68
	-----	-----	12.00	Bn	-----	-----	5.00	Bl, Bn, G, T	5.00	-----	5.00	-----	-----
330*	6.56	1.48	8.04	-----	1.03	0.50	3.96	-----	5.49	-----	-----	0.41	-----
	-----	-----	6.00	Bn, G, Super	-----	-----	8.00	Bl, Bn, G, T	8.00	-----	1.00	-----	-----
331	8.09	0.97	9.06	-----	-----	-----	4.78	-----	4.78	-----	3.51	-----	0.90
	7.00	1.00	8.00	Bn, Super	-----	-----	5.00	Bl, Bn, T	5.00	-----	3.50	-----	-----
332	8.32	1.25	9.57	-----	1.09	-----	2.51	-----	3.60	-----	3.18	-----	0.58
333	8.78	1.66	10.44	-----	0.49	0.25	3.77	-----	4.51	-----	2.61	-----	-----
	8.00	2.00	10.00	Bn, G, Super	-----	-----	4.00	Bl, Bn, G, T	4.00	-----	2.00	-----	-----
334	-----	-----	15.08	-----	-----	-----	5.24	-----	5.24	-----	-----	-----	-----
335*	-----	-----	3.37	-----	-----	-----	9.10	-----	9.10	-----	-----	-----	-----
	-----	-----	13.00	-----	-----	-----	5.00	-----	5.00	-----	-----	-----	-----
259	-----	-----	-----	-----	15.66	-----	-----	-----	-----	-----	-----	-----	-----
	-----	-----	-----	-----	15.00	-----	-----	-----	-----	-----	-----	-----	-----
260	-----	-----	16.66	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	-----	-----	16.90	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
261	-----	-----	18.12	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	-----	-----	18.26	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
235	7.40	3.89	11.29	-----	0.87	0.84	1.36	-----	3.07	-----	7.33	-----	0.68
337	5.51	3.52	9.03	-----	0.74	0.64	1.22	-----	2.60	-----	8.94	-----	0.84
	6.00	3.00	9.00	Bn- Super	0.50	-----	2.00	† Animal Matter.	2.50	-----	7.15	-----	-----
263	-----	-----	20.31	-----	-----	-----	2.70	-----	2.70	-----	-----	-----	-----
	-----	-----	20.00	-----	-----	-----	2.50	-----	2.50	-----	-----	-----	-----
264	7.37	3.64	11.01	-----	0.84	0.81	1.30	-----	2.95	5.18	5.18	10.36	5.74
	6.00	3.00	9.00	Bn- Super	0.50	-----	2.00	† Animal Matter.	2.50	5.00	5.00	10.00	-----
265	6.84	1.68	8.52	-----	1.90	0.24	1.00	-----	3.14	-----	6.74	-----	0.76
	5.00	2.00	7.00	Bn- Super	-----	-----	-----	† Animal Matter.	3.30	-----	6.00	-----	-----
266	8.40	2.73	11.13	-----	-----	0.85	0.81	-----	1.66	-----	11.21	-----	-----
	8.00	2.00	10.00	Bn- Super	-----	-----	-----	† Animal Matter.	1.65	-----	10.00	-----	-----

* 330—The goods from which this sample was taken were labeled as indicated above, but were straight bat guano. The company claims that they were mislabeled through error, and that the guarantee should be a lower one than that given above.

* 335—The company claims these goods to have had wrong tags attached through error.

† The term "animal matter" does not specify materials. However, no inferior materials were found in these goods.

ANALYSES AND VALUATIONS—Continued.

Laboratory Number	NAME AND ADDRESS OF MANUFACTURER OR DEALER AND NAME OF BRAND.	FROM WHOM OBTAINED.	Value per Ton at Station Prices.
	California Fertilizer Works, San Francisco, Cal.		
301	Special Fertilizer	E. Clemens Horst Co., San Francisco	\$32.17
302	do	do	29.96
	Guaranteed		29.28
267	Truck and Berry	Sam Meyer, Healdsburg	31.25
	Guaranteed		24.45
	Cudahy Packing Company, South Omaha, Neb.		
341*	Cudahy's Blood and Bone Fertilizer	G. A. Herdeg, Riverside	27.86
	Guaranteed		27.35
	Chas. S. Hardy, San Diego, Cal.		
342*	Hardy's Tankage	Charles S. Hardy, San Diego	31.25
	Guaranteed		25.94
	† Thomas Lewis, Sacramento, Cal.		
268	The Lewis Fertilizer	Manufacturer	5.32
273	do	L. L. Crocker, Loomis	5.36
	Guaranteed		11.29
	Maier Fertilizer Co., Los Angeles, Cal.		
247	"AA"	F. W. Ohmstead, Pomona	29.01
262	do	do	34.77
343	do	G. W. Dickson, Riverside	31.16
344	do	J. H. Anderson, Highland	31.39
	Guaranteed		32.00
345*	"T"	G. W. Dickson, Riverside	26.39
	Guaranteed		22.38
	Mapes Formula and Peruvian Guano Co., New York.		
346	Mapes Fruit and Vine Manure	J. J. Prendergast, Redlands	28.22
	Guaranteed		24.31
347	Mapes Orange Tree Manure	J. J. Prendergast, Redlands	25.16
	Guaranteed		22.37
	S. M. Neely, San Diego, Cal.		
245	Bird Guano	Wright Bros., Riverside	46.68
249	do	H. W. Stuart, Riverside	40.42
349	do	N. W. Blanchard, Santa Paula	35.82
351	do	S. M. Neely, San Diego	40.63
	Guaranteed		33.96
352	Blood	Arlington Hgts. Fruit Co., Riverside	47.27
	Guaranteed		47.88
353*	Tankage	C. C. Chapman, Fullerton	35.57
	Guaranteed		35.11

* 341—Rated as Tankage; 82 per cent fine.
* 342—97 per cent fine.
† See page 3.
* 345—Rated as Tankage; 76 per cent fine.
* 353—86 per cent fine.

ANALYSES AND VALUATIONS--Continued.

Laboratory Number	POUNDS PER HUNDRED.												Chlorin
	PHOSPHORIC ACID.				NITROGEN.					POTASH.			
	Available	Insoluble	Total	Guaranteed as Derived From	In Nitrates	In Ammonia Salts	Organic	Organic Nitrogen Guaranteed as Derived From	Total	From Muriate	From Sulfate	Total	
301	5.74	3.01	8.75	-----	1.29	0.37	2.15	-----	3.81	10.92	-----	-----	10.46
302	5.53	3.44	8.97	-----	1.11	0.38	2.21	-----	3.70	9.05	-----	-----	7.76
	4.00	3.00	7.00	Bn-Super	1.00	-----	2.25	Not given.	3.25	12.00	-----	-----	-----
267	8.07	3.11	11.18	-----	1.02	0.72	1.58	-----	3.32	-----	7.28	-----	1.96
	7.00	3.00	10.00	Bn-Super	-----	-----	-----	* Animal Matter.	2.50	-----	5.00	-----	-----
341	5.80	6.40	12.20	-----	-----	-----	5.38	-----	5.38	-----	-----	-----	0.58
	7.00	5.00	12.00	-----	-----	-----	5.00	-----	5.00	-----	-----	-----	-----
342	-----	-----	20.67	-----	-----	-----	3.78	-----	3.78	-----	-----	-----	-----
	-----	-----	12.00	-----	-----	-----	4.50	-----	4.50	-----	-----	-----	-----
268	1.57	0.28	1.85	-----	-----	-----	0.80	-----	0.80	-----	-----	0.41	-----
273	1.34	0.88	2.22	-----	-----	-----	0.82	-----	0.82	-----	-----	0.37	0.54
	0.15	2.60	2.75	Sewage	-----	-----	2.75	Sewage, Bl, Fish.	2.75	-----	-----	0.15	-----
247	6.01	6.65	12.66	-----	-----	-----	4.82	-----	4.82	-----	1.33	-----	0.60
262	5.12	5.70	10.82	-----	-----	-----	5.16	-----	5.16	-----	6.43	-----	-----
343	6.61	6.66	13.27	-----	-----	-----	4.83	-----	4.83	-----	2.49	-----	0.58
344	7.23	6.53	13.76	-----	-----	-----	5.00	-----	5.00	-----	1.62	-----	0.86
	7.00	5.00	12.00	Bn, T	-----	-----	5.00	Bl, Bn, T	5.00	-----	3.00	-----	-----
345	7.40	7.25	14.65	-----	-----	-----	4.26	-----	4.26	-----	-----	-----	-----
	8.00	6.00	14.00	Bn, T	-----	-----	3.00	Bl, Bn, T	3.00	-----	-----	-----	-----
346	5.41	2.88	8.29	-----	1.12	0.32	0.65	-----	2.09	-----	11.16	-----	1.56
	5.00	2.00	7.00	†	-----	-----	-----	†	1.65	-----	10.00	-----	-----
347	5.91	5.09	11.00	-----	2.24	0.38	0.76	-----	3.38	-----	3.80	-----	1.56
	6.00	2.00	8.00	†	-----	-----	-----	†	3.29	-----	3.00	-----	-----
245	7.99	0.71	8.70	-----	0.81	2.35	8.42	-----	11.58	-----	-----	2.18	1.86
249	8.78	0.60	9.38	-----	0.76	2.15	6.30	-----	9.21	-----	-----	1.74	2.62
349	12.14	3.96	16.10	-----	0.84	1.75	3.22	-----	5.81	-----	-----	1.35	1.60
351	10.23	1.51	11.74	-----	0.96	2.48	5.02	-----	8.46	-----	-----	1.66	2.74
	8.86	1.10	9.96	-----	0.63	1.67	4.67	-----	6.97	-----	-----	1.74	-----
352	-----	-----	-----	-----	-----	-----	13.13	-----	13.13	-----	-----	-----	-----
	-----	-----	-----	-----	-----	-----	13.30	-----	13.30	-----	-----	-----	-----
353	5.52	7.09	12.61	-----	-----	-----	7.66	-----	7.66	-----	-----	-----	-----
	7.00	7.00	14.00	-----	-----	-----	7.00	-----	7.00	-----	-----	-----	-----

* The term "animal matter" does not specify materials. However, no inferior materials were found in these goods.

† These goods did not have guarantees and materials properly stated. The company claimed that old tags were attached through error. Samples of tags claimed to be proper ones were submitted, and were satisfactory. No inferior materials were found.

ANALYSES AND VALUATIONS—Continued.

Laboratory Number.....	NAME AND ADDRESS OF MANUFACTURER OR DEALER AND NAME OF BRAND.	FROM WHOM OBTAINED.	Value per Ton at Station Prices.....
	S. M. Neely, San Diego, Cal.		
354*	Tankage.....	C. B. Hoadley, Redlands.....	\$32.58
	Guaranteed.....		33.87
	Pacific Bone, Coal, and Fertilizing Co., San Francisco, Cal.		
356*	Pure Bone Meal.....	Cox Seed and Plant Co., San Francisco.....	27.77
	Guaranteed.....		26.06
357*	Pure Bone Meal.....	Manufacturers.....	27.97
	Guaranteed.....		24.76
358	Ceres.....	Manufacturers.....	28.76
	Guaranteed.....		25.68
237	“EE”.....	Eggers Vineyard Co., San Francisco.....	30.27
	Guaranteed.....		26.46
359	Lupine.....	Manufacturers.....	24.95
	Guaranteed.....		23.30
360	Pomona.....	Manufacturers.....	30.92
	Guaranteed.....		30.00
	Southern California Fertilizer Co., Ontario, Cal.		
304	Orange.....	E. M. Izard, Brynmawr.....	28.55
361	do.....	Manufacturers.....	26.80
362	do.....	H. P. D. Kingsbury, Redlands.....	28.69
363	do.....	B. E. Sibley, Rialto.....	27.70
	Guaranteed.....		24.77
364	Orange Special.....	Manufacturers.....	31.25
365	do.....	H. P. D. Kingsbury, Redlands.....	31.36
	Guaranteed.....		29.89
366	Orange and Lemon.....	Manufacturers.....	28.51
367	do.....	B. E. Sibley, Rialto.....	27.67
	Guaranteed.....		24.77
	Swift & Co., Chicago, Ill.		
372	Swift’s Pure Diamond “A”.....	W. E. Sprott, Porterville.....	29.75
	Guaranteed.....		30.52
373	Swift’s Pure Diamond “B”.....	W. E. Sprott, Porterville.....	28.73
	Guaranteed.....		28.85
374*	Swift’s Pure Diamond “E”.....	C. B. Smith, Redlands.....	31.68
375*	do.....	Edward L. Koethen, Riverside.....	32.52
	Guaranteed.....		32.58

* 354—84 per cent fine. * 357—45 per cent fine. * 375—80 per cent fine.
* 356—49 per cent fine. * 374—80 per cent fine.

Samples 374 and 375, not being acidulated and having no guarantee of available phosphoric acid, are rated as tankage.

ANALYSES AND VALUATIONS—Continued.

Laboratory Number.	POUNDS PER HUNDRED.												Chlorin
	PHOSPHORIC ACID.				NITROGEN.					POTASH.			
	Available ..	Insoluble ..	Total	Guaranteed as Derived From	In Nitrates.	In Ammo- nia Salts ..	Organic	Organic Nitrogen Guaranteed as Derived From	Total	From Muriate ..	From Sulfate ..	Total	
354	6.43 8.36	7.76 5.39	14.19 13.75				6.35 6.40		6.35 6.40				
356			23.99 22.00				2.79 2.75		2.79 2.75				
357			23.86 21.00				3.07 2.75		3.07 2.75				
358	9.20 7.00	1.75 3.00	10.95 10.00	Bn, Super		1.79 1.50	1.28 1.25	Bn, T	3.07 2.75		4.94 5.00		0.62
237	8.34 6.00	4.75 6.00	13.09 12.00	Bn, Super	0.98 0.80	1.24 0.80	1.13 1.40	Bn, T	3.35 3.00		5.35 5.00		0.66
359	11.13 9.00	1.66 1.00	12.79 10.00	Super							8.97 10.00		0.58
360	8.20 6.00	1.47 2.00	9.67 8.00	Bn, Super		1.68 1.75	1.06 1.00	Bl, Bn, T	2.74 2.75		8.90 10.00		0.70
304	9.39	2.04	11.43		1.25		2.50		3.75		3.03		0.66
361	8.10	2.44	10.54		1.06		2.48		3.54		3.24		0.52
362	8.61	2.50	11.11		1.37		2.60		3.97		3.13		0.54
363	8.49 9.00	2.39 1.00	10.88 10.00	Bn, T, Super	1.44 1.20		2.44 2.10	Bl, Bn, T	3.88 3.30		2.76 2.00		0.52
364	8.46	2.26	10.72		1.62		3.06		4.68		3.53		
365	8.59 10.00	1.85 1.00	10.44 11.00	Bn, T, Super	2.00 1.40		2.67 2.70	Bl, Bn, T	4.67 4.10		3.82 3.00		
366	8.03	2.55	10.58		1.51		2.24		3.75		4.23		
367	8.37 8.00	2.25 1.00	10.62 9.00	Bn, T, Super	1.21 1.20		2.39 2.10	Bl, Bn, T	3.60 3.30		3.65 3.00		
372	13.46 15.00	3.89 2.00	17.35 17.00	Bn			3.33 3.29	Acidulated. Bl, Bn, T	3.33 3.29				
373	14.56 16.00	3.53 2.00	18.09 18.00	Bn			2.71 2.47	Acidulated. Bl, Bn, T	2.71 2.47				
374			19.37				4.58		4.58				
375			19.39 19.00	Bn			4.83 4.95	Bl, Bn, T	4.83 4.95				

ANALYSES AND VALUATIONS—Continued.

Laboratory Number.....	NAME AND ADDRESS OF MANUFACTURER OR DEALER AND NAME OF BRAND.	FROM WHOM OBTAINED.	Value per Ton at Station Prices.....
	Swift & Co., Chicago., Ill.		
376*	Swift's Pure Diamond "G"	Edward L. Koethen, Riverside	\$34.45
377*	do	C. B. Smith, Redlands	35.15
378*	do	W. E. Sprott, Porterville	34.27
	Guaranteed		33.00
368	Swift's Pure Dried Blood	Edward L. Koethen, Riverside	46.91
369	do	C. B. Smith, Redlands	46.47
	Guaranteed		47.52
280*	Swift's Pure Special Bone Meal	E. F. Goff, Riverside	29.22
370*	do	C. B. Smith, Redlands	27.84
371*	do	Edward L. Koethen, Riverside	28.85
	Guaranteed		26.19
	Union Fertilizer Co., Los Angeles.		
380*	Bone Meal	H. N. Pierce, Claremont	26.80
	Guaranteed		24.05
381	Fruiting Fertilizer	E. E. Cole, Redlands	27.50
382	do	J. W. Freeman, Upland	23.02
383	do	J. F. Jackson, Riverside	27.55
384	do	H. N. Pierce, Claremont	22.72
385	do	C. A. Miller, Highland	25.48
	Guaranteed		23.87
386	Special Fruiting Fertilizer	H. N. Pierce, Claremont	26.42
387	do	J. F. Jackson, Riverside	29.73
388	do	C. A. Miller, Highland	32.67
389	do	E. E. Cole, Redlands	30.89
	Guaranteed		29.08
390	Lawn Fertilizer	H. N. Pierce, Claremont	28.11
	Guaranteed		27.20
391	Nursery Fertilizer	J. W. Freeman, Upland	27.84
	Guaranteed		27.20
392*	Special Fertilizer	C. H. Low, Riverside	34.12
	Guaranteed		31.12
	Western Meat Co., San Francisco.		
303*	W. M. Co. Tankage	E. Clemens Horst Co., San Francisco	35.43
	Guaranteed		35.94
281*	W. M. Co. Tankage	F. H. Hersey, Oakland	34.82
393*	do	Manufacturers	35.08
	Guaranteed		38.10
	Woodbridge Chemical Works, San Bernardino, Cal.		
272	The Woodbridge Citrus A	J. W. Gore, Redlands	30.22
	Guaranteed		27.30

*Samples 376 to 378, not being acidulated and having no guarantee of available phosphoric acid, are rated as tankage.

- * 376—80 per cent fine.
- * 377—72 per cent fine.
- * 378—77 per cent fine.
- * 280—57 per cent fine.
- * 370—57 per cent fine.
- * 371—64 per cent fine.
- * 380—28 per cent fine.
- * 392—This sample is tankage; 75 per cent fine.
- * 303—80 per cent fine.
- * 281—78 per cent fine.
- * 393—75 per cent fine.

ANALYSES AND VALUATIONS—Continued.

Laboratory Number.....	POUNDS PER HUNDRED.												Chlorin
	PHOSPHORIC ACID.				NITROGEN.					POTASH.			
	Available ..	Insoluble...	Total	Guaranteed as Derived From	In Nitrates..	In Ammo- nia Salts ..	Organic	Organic Nitrogen Guaranteed as Derived From	Total	From Muriate..	From Sulfate ..	Total	
376	-----	-----	20.70	-----	-----	-----	3.43	-----	3.43	-----	-----	*4.50	3.16
377	-----	-----	19.19	-----	-----	-----	3.66	-----	3.66	-----	-----	*5.54	3.52
378	-----	-----	20.01	-----	-----	-----	3.26	-----	3.26	-----	-----	*5.31	3.80
	-----	-----	19.00	Bn	-----	-----	3.25	Bl, Bn, T	3.25	-----	5.60	-----	-----
368	-----	-----	-----	-----	-----	-----	13.03	-----	13.03	-----	-----	-----	-----
369	-----	-----	-----	-----	-----	-----	12.91	-----	12.91	-----	-----	-----	-----
	-----	-----	-----	-----	-----	-----	13.20	-----	13.20	-----	-----	-----	-----
280	-----	-----	27.26	-----	-----	-----	2.24	-----	2.24	-----	-----	-----	-----
370	-----	-----	25.76	-----	-----	-----	2.19	-----	2.19	-----	-----	-----	-----
371	-----	-----	26.41	-----	-----	-----	2.34	-----	2.34	-----	-----	-----	-----
	-----	-----	29.00	-----	-----	-----	0.82	-----	0.82	-----	-----	-----	-----
380	-----	-----	20.81	-----	-----	-----	3.73	-----	3.73	-----	-----	-----	-----
	-----	-----	22.00	-----	-----	-----	2.50	-----	2.50	-----	-----	-----	-----
381	8.78	2.60	11.38	-----	0.49	1.06	1.72	-----	3.27	-----	3.59	-----	0.90
382	7.92	1.34	9.26	-----	0.13	0.87	1.45	-----	2.45	-----	3.53	-----	1.16
383	8.09	3.07	11.16	-----	0.56	1.22	1.69	-----	3.47	-----	3.55	-----	0.78
384	7.74	1.19	8.93	-----	0.15	0.71	1.41	-----	2.27	-----	4.05	-----	1.10
385	8.37	1.81	10.18	-----	0.60	0.60	1.75	-----	2.95	-----	3.65	-----	1.16
	7.00	2.00	9.00	Bn, T, G, Super	0.75	0.60	1.65	Bn, G, T	3.00	-----	3.50	-----	-----
386	8.18	1.98	10.16	-----	0.33	1.02	1.71	-----	3.06	-----	4.11	-----	1.36
387	8.96	1.54	10.50	-----	0.93	1.13	1.63	-----	3.69	-----	4.63	-----	1.20
388	10.02	1.86	11.88	-----	0.86	0.82	2.32	-----	4.00	-----	4.98	-----	1.24
389	9.13	1.84	10.97	-----	0.67	0.94	2.30	-----	3.91	-----	4.59	-----	1.54
	8.00	2.00	10.00	Bn, T, G, Super	1.00	0.75	2.25	Bn, T, G	4.00	-----	4.00	-----	-----
390	6.57	4.91	11.48	-----	0.25	0.77	3.58	-----	4.60	-----	1.41	-----	1.28
	6.00	2.00	8.00	Bn, T, G, Super	1.00	1.00	3.00	-----	5.00	-----	1.50	-----	1.28
391	6.54	5.33	11.87	-----	0.53	0.75	3.34	-----	4.62	-----	1.08	-----	1.26
	6.00	2.00	8.00	Bn, T, G, Super	1.00	1.00	3.00	-----	5.00	-----	1.50	-----	-----
392	-----	-----	15.40	-----	-----	-----	6.47	-----	6.47	-----	-----	-----	-----
	-----	-----	11.45	-----	-----	-----	6.58	-----	6.58	-----	-----	-----	-----
303	-----	-----	7.41	-----	-----	-----	8.86	-----	8.86	-----	-----	-----	-----
	-----	-----	7.55	-----	-----	-----	8.98	-----	8.98	-----	-----	-----	-----
281	-----	-----	8.04	-----	-----	-----	8.55	-----	8.55	-----	-----	-----	-----
393	-----	-----	9.15	-----	-----	-----	8.40	-----	8.40	-----	-----	-----	-----
	-----	-----	8.50	-----	-----	-----	9.50	-----	9.50	-----	-----	-----	-----
272	5.41	3.94	9.35	-----	0.79	-----	3.46	-----	4.25	-----	6.00	-----	0.70
	5.00	5.00	10.00	Bn, G, Super	-----	-----	4.00	Bl, Bn, G, T	4.00	-----	4.00	-----	-----

* Less than one half the potash in samples 376, 377, and 378 is derived from sulfate of potash.

ANALYSES AND VALUATIONS—Continued.

Laboratory Number	NAME AND ADDRESS OF MANUFACTURER OR DEALER AND NAME OF BRAND.	FROM WHOM OBTAINED.	Value per Ton at Station Prices
	Woodbridge Chemical Works, San Bernardino, Cal.		
394	Citrus B	T. A. Blakely, Redlands	\$17.86
395	do	Manufacturers	24.30
	Guaranteed		18.98
246	Woodbridge Orange and Lemon No. 1	James M. Riley, Azusa	28.96
396	do	A. M. Seely, Glendora	27.95
397	do	A. M. Seely, Covina	26.88
	Guaranteed		28.50
379	Woodbridge No. 1	A. P. Kitching, Redlands	28.80
	Guaranteed		28.26
398	Woodbridge Rose and Lawn	Manufacturers	22.64
	Guaranteed		20.25
242	Woodbridge Special Orange and Lemon Fertilizer	J. H. Williams, Porterville	26.44
	Guaranteed		24.30
243	Woodbridge Special Orange Fertilizer	J. H. Williams, Porterville	23.94
	Guaranteed		22.00
305	Woodbridge Riverside Special	J. H. Williams, Porterville	21.25
	Guaranteed		23.69
306	Woodbridge Special Fertilizer	J. H. Williams, Porterville	27.53
	Guaranteed		24.10
307	Woodbridge Special Fertilizer	J. H. Williams, Porterville	24.07
	Guaranteed		20.94
399	Woodbridge Special Fertilizer	A. M. Seely, Covina	23.35
	Guaranteed		25.30
400	Woodbridge Riverside Special Fertilizer	A. M. Seely, Covina	24.34
	Guaranteed		27.30
401	Woodbridge Special Vegetable Fertilizer	Manufacturers	22.50
	Guaranteed		26.05
402	Sulfate of Potash	Woodbridge Chem. Wks., San Berdo.	57.07
	Guaranteed		58.32

ANALYSES AND VALUATIONS—Continued.

Laboratory Number.....	POUNDS PER HUNDRED.												Chlorin -----
	PHOSPHORIC ACID.				NITROGEN.					POTASH.			
	Available --	Insoluble ---	Total -----	Guaranteed as Derived From -----	In Nitrates -	In Ammo- nia Salts --	Organic -----	Organic Nitrogen Guaranteed as Derived From	Total -----	From Muriate --	From Sulfate ---	Total -----	
394	3.38	3.61	6.99	-----	0.44	-----	1.90	-----	2.34	-----	3.32	-----	-----
395	5.04	5.40	10.44	-----	0.53	-----	2.68	-----	3.21	-----	3.78	-----	-----
	4.00	4.00	8.00	Bn, T, G	*	*	*	Bl, Bn, G	2.50	-----	3.00	-----	-----
246	4.84	3.44	8.28	-----	-----	-----	4.60	-----	4.60	-----	4.44	-----	0.72
396	5.53	4.33	9.86	-----	0.36	0.55	2.73	-----	3.64	-----	5.40	-----	0.54
397	5.31	4.41	9.72	-----	0.54	0.30	2.40	-----	3.24	-----	5.96	-----	-----
	5.00	5.00	10.00	Bn	-----	-----	4.00	Bl, Bn, G	4.00	-----	5.00	-----	-----
379	5.54	5.83	11.37	-----	0.53	-----	3.26	-----	3.79	-----	5.15	-----	-----
	-----	-----	10.00	Not given	*	*	*	Sources not given.	4.00	-----	5.00	-----	-----
398	5.17	6.76	11.93	-----	0.97	-----	1.76	-----	2.73	-----	3.24	-----	-----
	5.00	5.00	10.00	Bn, G	-----	-----	2.50	Bn, G	2.50	-----	2.50	-----	-----
242	4.98	5.65	10.63	-----	0.32	0.37	2.86	-----	3.55	-----	4.42	-----	0.56
	-----	-----	10.00	Not given	*	*	*	Not given	3.00	-----	4.00	-----	-----
243	4.30	5.17	9.47	-----	0.18	0.20	2.48	-----	2.86	-----	5.19	-----	0.60
	-----	-----	10.00	Not given	*	*	*	Not given	2.00	-----	5.00	-----	-----
305	3.89	4.15	8.04	-----	-----	-----	2.75	-----	2.75	-----	4.07	-----	0.72
	-----	-----	10.00	Bn	-----	-----	3.00	Bl, Bn	3.00	-----	4.00	-----	-----
306	3.65	6.17	9.82	-----	-----	-----	4.05	-----	4.05	-----	4.90	-----	0.74
	-----	-----	10.00	Bn	-----	-----	3.00	Bl, Bn	3.00	-----	5.00	-----	-----
307	4.27	5.89	10.16	-----	-----	-----	2.65	-----	2.65	-----	5.60	-----	0.66
	-----	-----	10.00	Bn	-----	-----	2.00	Bl, Bn	2.00	-----	5.00	-----	-----
399	4.99	3.70	8.69	-----	1.03	-----	2.02	-----	3.05	-----	4.38	-----	-----
	8.00	2.00	10.00	Bn, G, Super	1.50	-----	1.50	Bl, Bn, G	3.00	-----	4.00	-----	-----
400	7.50	1.26	8.76	-----	1.43	-----	1.64	-----	3.07	-----	3.78	-----	-----
	5.00	5.00	10.00	Bn	-----	-----	4.00	Bl, Bn, G	4.00	-----	4.00	-----	-----
401	4.70	6.02	10.72	-----	0.83	-----	2.68	-----	3.51	-----	1.58	-----	-----
	-----	-----	9.00	Bn, G, Super	-----	-----	4.00	Bl, Bn, G	4.00	-----	4.00	-----	-----
402	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	47.56	-----	2.04
	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	48.60	-----	-----

* Forms of nitrogen not specified in guarantee.

Sample 348—Pigeon manure, sent by A. J. Everest, Riverside: Phosphoric acid, 1.84 per cent; nitrogen, 1.26 per cent; potash, 0.75 per cent.

Six samples of gypsum were analyzed, ranging in purity from 26.92 per cent to 68.70 per cent.

REPORT OF SALES.

Below is a statement of sales for last year and for the present year so far as the returns are in. These figures are taken from the sworn statements of dealers and manufacturers required by Section 8 of the fertilizer law:

	1903-04	1904-05
First quarter.....	1,404 tons	773 tons
Second quarter	1,453 "	1,366 "
Third quarter.....	5,150 "	5,734 "
Fourth quarter.....	1,783 "	----- "
Total.....	9,790 "	----- "

CALIFORNIA FERTILIZER LAW.

CHAPTER CCXXV.—*An act to regulate the sale of commercial fertilizers or materials used for manurial purposes, and to provide penalties for the infraction thereof, and means for the enforcement of the act.*

[Approved March 20, 1903.]

The People of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. Every lot, parcel, or package of commercial fertilizers or materials to be used for manurial purposes (excepting the dung of domestic animals), sold, offered or exposed for sale, within this State, shall be accompanied by a plainly printed label, stating the name, brand, and trade mark, if any there be, under which the fertilizer is sold, the name and address of the manufacturer, importer, or dealer, the place of manufacture, and a chemical analysis, stating the percentages claimed to be therein; of nitrogen, specifying the form or forms in which it is present; of phosphoric acid, available and insoluble; and of potash, soluble in distilled water, and the materials from which all of said constituents are derived. All analyses are to be made according to the methods agreed upon by the American Association of Official Agricultural Chemists. In the case of those fertilizers, the selling

price of which is less than eight dollars (\$8) per ton, said label need only give a correct general statement of the nature and composition of the fertilizer it accompanies.

SEC. 2. No person shall sell, offer or expose for sale in this State, any pulverized leather, hair, ground hoofs, horns, or wool waste, raw, steamed, roasted, or in any form as a fertilizer, or as an ingredient of a fertilizer or manure, without an explicit statement of the fact; said statement to be conspicuously affixed to every package of such fertilizer or manure, and to accompany and go with every lot, parcel, or package of the same.

SEC. 3. The manufacturer, importer, agent of, or dealer in any commercial fertilizers, or materials used for manurial purposes, the selling price of which to the consumer is eight (\$8) dollars or more per ton, shall, before the same is offered for sale, obtain a certificate of registration from the Secretary of the Board of Regents of the University of California, countersigned by the Director of the Agricultural Experiment Station of the said University, authorizing the sale of fertilizers in this State, and shall securely fix to each lot, parcel or package of fertilizer the word "registered" with the number of registry. The manufacturer, importer, agent, or dealer, obtaining such registry, shall pay to the said Secretary the sum of fifty (\$50) dollars, to be applied as provided in section nine of this act; such registration shall expire on the thirtieth day of June of the fiscal year for which it was given; *provided*, the provisions of this section shall not apply to any agent whose principals shall have obtained a certificate of registration as herein provided. Every such manufacturer, importer, agent, or dealer, who makes or sells, or offers for sale, any such substances, under a name or brand, shall file, on or before the first day of July, in each year, a statement, under oath, with said Director, stating such name or brand, and stating the component parts in accordance with the provisions of section one of this act, of the substances to be sold, or offered for sale, or manufactured under each such name or brand.

SEC. 4. The said Director shall annually, on or before the first day of September, take samples in accordance with the provisions of section five hereof of the substance made, sold, or offered for sale, under every such name or brand, and cause analyses to be made thereof in accordance with the provisions of section one hereof, and said analyses may include such other determinations as said Director may at any time deem advisable. Dealers in, or manufacturers of fertilizers, must give free access to the Director of the Agricultural Experiment Station, or his duly authorized deputy, to all the materials which they may place on the market for sale in California. Whenever the analysis certified by the said Director shall show a deficiency of not more than one fourth of one per cent of nitrogen, or one per cent of soluble or avail-

able phosphoric acid, or one half of one per cent of potash soluble in distilled water, the statement of the manufacturer or importer, as required in section one of this act, shall not be deemed to be false in the meaning of this act; *provided*, that this act shall not apply to sales of fertilizing materials made to a registered manufacturer of fertilizers, or to sales for export outside of this State; *provided further*, that the said Director of the Agricultural Experiment Station of the University of California shall, upon the receipt of a sample of fertilizer, accompanied with a nominal fee of two (\$2) dollars, furnish to the user of said commercial fertilizer, such examination or analysis of the sample as will substantially establish the conformity or non-conformity of the said fertilizer to the guarantee under which it was sold.

SEC. 5. The Director of the Agricultural Experiment Station of the University of California, in person or by deputy, is hereby authorized to take a sample not exceeding two pounds in weight for analysis by the said Director, or his deputies, from any lot, parcel, or package of fertilizer, or material, or mixture of materials used for manurial purposes, which may be in the possession of any manufacturer, importer, agent or dealer, but said sample shall be drawn in the presence of said party or parties in interest, or their representatives. In lots of five tons or less, samples shall be drawn from at least ten packages, or if less than ten packages are present, all shall be sampled. In lots of over five tons, not less than twenty packages shall be sampled. The samples so drawn shall be thoroughly mixed, and from it two equal samples shall be drawn and placed in glass vessels, carefully sealed, and a label placed on each, stating the name or brand of the fertilizer or material sampled, the name of the party from whose stock the sample was drawn, and the time and place of drawing; and said label shall also be signed by the said Director or his deputy making such inspection, and by the party or parties in interest, or their representatives present at the drawing and sealing of said samples. One of said duplicate samples shall be retained by the party whose stock was sampled, and the other by the Director of the Agricultural Experiment Station of the University of California.

SEC. 6. The Director of the Agricultural Experiment Station of the University of California shall publish in bulletin form, from time to time, at least annually, the results of the analysis hereinbefore provided, with such additional information as circumstances may advise.

SEC. 7. There is hereby appropriated for the use of the Agricultural Experiment Station of the University of California at Berkeley, Alameda County, as set forth in this act, out of any moneys in the treasury not otherwise appropriated, the sum of eighteen hundred (\$1,800) dollars for the equipment of a laboratory, with the chemicals and apparatus, and other incidentals necessary to the successful prosecution of the work.

SEC. 8. In order to further provide for the necessary expenses of this work, there shall be paid by the manufacturer, importer, agent, or dealer, twenty-five cents for every ton of fertilizer sold, the selling price of which to the consumer is eight (\$8) dollars or more per ton. A statement sworn to by the manufacturer, importer, agent, or dealer, of such sales, shall be rendered quarterly to the Secretary of the Board of Regents of the University of California, accompanied by the corresponding amount of the special license fee as above specified; *provided*, that whenever the manufacturer or importer shall have paid the special license fee herein required, for any person acting as agent or seller for such manufacturer or importer, such agent or seller shall not be required to pay the special license fee named in this section. On receipt of said special license fee and statement, the said Secretary shall issue to the manufacturer, importer, agent, or dealer, a certificate of compliance with this section.

SEC. 9. All moneys, whether received from registry and analytical fees or special license fees, shall be paid to the Secretary of the Board of Regents of the University of California, for the use of said board in carrying out the provisions of this act.

SEC. 10. Any party selling, offering, or exposing for sale, any commercial fertilizer without the statement required by section one of this act, or with a label stating that said fertilizer contains a larger percentage of any one or more of the constituents mentioned in said section than is actually contained therein, except as provided for in section four, or respecting the sale of which all the provisions of this act have not been fully complied with, shall be deemed guilty of a misdemeanor, and upon conviction thereof before any court of competent jurisdiction, shall be fined in a sum not less than fifty (\$50) dollars and costs of action for the first offense, and one hundred (\$100) dollars and costs of the action for each subsequent offense. Said fines to be paid into the school fund of the county in which conviction is had.

SEC. 11. In any action, civil or criminal, in any court in this State, a certificate under the hand of said Director, and the seal of said University, stating the results of any analysis, purporting to have been made under the provisions of this act, shall be prima facie evidence of the fact that the sample or samples mentioned in said analysis or certificate were properly analyzed as in this act provided; that such samples were taken as in this act provided; that the substances analyzed contained the component parts stated in such certificate and analysis; and that the samples were taken from the parcels or packages or lots mentioned or described in said certificate.

SEC. 12. This act shall take effect and be in force from and after July first, nineteen hundred and three.

CALIFORNIA PUBLICATIONS AVAILABLE FOR DISTRIBUTION.

REPORTS.

- 1896. Report of the Viticultural Work during the seasons 1887-93, with data regarding the Vintages of 1894-95.
- 1897. Resistant Vines, their Selection, Adaptation, and Grafting. Appendix to Viticultural Report for 1896.
- 1898. Partial Report of Work of Agricultural Experiment Station for the years 1895-96 and 1896-97.
- 1900. Report of the Agricultural Experiment Station for the year 1897-98.
- 1902. Report of the Agricultural Experiment Station for 1898-1901.
- 1903. Report of the Agricultural Experiment Station for 1901-1903.
- 1904. Twenty-second Report of the Agricultural Experiment Station for 1903-1904.

BULLETINS.

- Reprint.* Endurance of Drought in Soils of the Arid Region.
- No. 129. Report of the Condition of Olive Culture in California.
- 131. The Phylloxera of the Vine.
 - 132. Feeding of Farm Animals.
 - 133. Tolerance of Alkali by Various Cultures.
 - 135. The Potato-Worm in California.
 - 137. Pickling Ripe and Green Olives.
 - 138. Citrus Fruit Culture.
 - 139. Orange and Lemon Rot.
 - 140. Lands of the Colorado Delta in Salton Basin, and Supplement.
 - 141. Deciduous Fruits at Paso Robles.
 - 142. Grasshoppers in California.
 - 143. California Peach-Tree Borer.
 - 144. The Peach-Worm.
 - 145. The Red Spider of Citrus Trees.
 - 146. New Methods of Grafting and Budding Vines.
 - 147. Culture Work of the Substations.
 - 148. Resistant Vines and their Hybrids.
 - 149. California Sugar Industry.
 - 150. The Value of Oak Leaves for Forage.
 - 151. Arsenical Insecticides.
 - 152. Fumigation Dosage.
 - 153. Spraying with Distillates.
 - 154. Sulfur Sprays for Red Spider.
 - 155. Directions for Spraying for the Codling-Moth.
 - 156. Fowl Cholera.
 - 157. Commercial Fertilizers.
 - 158. California Olive Oil; its Manufacture.
 - 159. Contribution to the Study of Fermentation.
 - 160. The Hop Aphis.
 - 161. Tuberculosis in Fowls.
 - 162. Commercial Fertilizers.
 - 163. Pear Scab.
 - 164. Poultry Feeding and Proprietary Foods.
 - 165. Asparagus and Asparagus Rust in California.
 - 166. Spraying for Scale Insects.
 - 167. Manufacture of Dry Wines in Hot Countries.
 - 168. Observations on Some Vine Diseases in Sonoma County.
 - 169. Tolerance of the Sugar Beet for Alkali.
 - 170. Studies in Grasshopper Control.

CIRCULARS.

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|---------------------------------|------------------------------------|
| No. 1. Texas Fever. | No. 10. Reading Course in Economic |
| 2. Blackleg. | Entomology. |
| 3. Hog Cholera. | 11. Fumigation Practice. |
| 4. Anthrax. | 12. Silk Culture. |
| 5. Contagious Abortion in Cows. | 13. The Culture of the Sugar Beet. |
| 7. Remedies for Insects. | 14. Practical Suggestions for Cod- |
| 9. Asparagus Rust. | ling-Moth Control in the |
| | Pajaro Valley. |

Copies may be had by application to the Director of the Experiment Station, Berkeley, California.

